Roseland Community Wind Scheme, Shirebrook, Derbyshire - Archaeological Desk Based Assessment

Roseland Community Energy Trust

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Report prepared by:
ECUS Ltd.
Brook Holt
3 Blackburn Road
Sheffield
S61 2DW
0114 266 9292

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Ecus Ltd

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Originated By:
Andrew Burn
Heritage Consultant Date: 29th March 2012

Reviewed By: **Erica Kemp**
Technical Director

Approved By: **Simon McCudden**
Technical Director

Prepared by:
ECUS Ltd.
Brook Holt
3 Blackburn Road
Sheffield
S61 2DW
TEL: 0114 2669292
FAX: 0114 2668243

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EXECUTIVE SUMMARY

In April 2011 ECUS Ltd undertook an archaeological desk based assessment on behalf of the Roseland Community Energy Trust. The archaeological assessment has been undertaken in advance of a formal Environmental Impact Assessment of a proposed wind turbine scheme at Roseland Wood near Shirebrook in Derbyshire. The assessment was commissioned to undertake an initial appraisal of the likely issues and constraints relating to archaeology and cultural heritage associated with the proposed scheme and to scope the requirements for formal impact assessment in respect of these issues. The DBA also aimed to provide information to guide the design of the scheme and its layout.

The Desk Based Assessment revealed that the potential for below ground archaeology is low, with the potential for surviving although truncated remains of Romano British or Prehistoric evidence. Isolated find spots of Roman pottery and worked flint within the development boundary along with two proximal crop mark sites suggest that surviving archaeology may be encountered. However a long history of ploughing from the medieval period onwards suggests that this may now be heavily truncated.

It was also noted that the visual and setting impacts upon nearby historic assets will require assessment as part of the EIA. Scheduled Ancient Monuments and the vistas and designed landscapes that surround them at Sutton Scardale Hall, Bolsover Castle and Hardwick Hall will all be affected by the proposed development. In particular the parkland views from Hardwick Hall and the surrounding estate will require consideration.

A Geophysical Survey of the proposed locations for the six turbines revealed varying degrees of potential, to be targeted for further evaluation.

It is recommended that a targeted programme of evaluation trenching, based on the geophysics results be undertaken prior to any construction taking place to ascertain the survival of below ground archaeological features. Also consultation with English Heritage, the National Trust and the local planning authority should take place in order to minimise the potential visual impacts on the surrounding heritage assets.

1. Introduction

The site is located to the south of Rosedale wood, 1.3km to the west of the town of Shirebrook. This Desk Based assessment aims to evaluate the potential for survival of below ground archaeology. This assessment will also consider the need for assessment of impacts of development upon both extant heritage assets within 5km and below ground archaeological deposits. A pre-existing desk based assessment and archaeological evaluation at a site located just to the east was also consulted. This DBA and evaluation undertaken in 2008 by West Yorkshire Archaeological Services (WYAS) was carried out for Banks Developments and located 300m to the east of the currently proposed site at Losk Lane.

2. Location, Geology and Land use

2.1 Location

The site is centred at SK 49992 67167 1.3km west of Shirebrook in Derbyshire. The site is located 4.9km south east of the historic site at Bolsover castle and occupies a 1.9km2 area to the south of Roseland wood. The development area is also 4.03km north west of Hardwick Hall, another historic property currently maintained by the National Trust.

2.2 Land use

The site is currently arable farmland owned by the Chatsworth Estate and utilised by tenant farmers including Roseland Farm. There are a number of existing tracks within the development area. There is no evidence from historic mapping to suggest a different historic land use, and evidence from aerial photography shows both medieval and post medieval ridge and furrow ploughing within the development area.

2.3 Geology

The site is on superficial geological deposits of clay over Cadeby formation Dolostone. (BGS online)

3. Methodology

This desk based assessment has consulted the following sources:

- Derbyshire County Council HER
- National Monuments Record (NMR)
- British Geological Survey
- East Midlands Regional Research Framework
- Headland Archaeology geophysical survey

This desk based assessment aims to evaluate available archaeological evidence concerning the development site. This initial assessment will provide information on archaeological assets, archaeological potential and put forward possible strategies to allow the provision of sufficient archaeological mitigation works if required.

4. Study Area

This Desk Based assessment looked at historic assets whose setting may be impacted upon in a five kilometre radius around the development. The following section discusses the most relevant sites either within or proximal to the site boundary or those within 5km that may have potential for setting impacts.

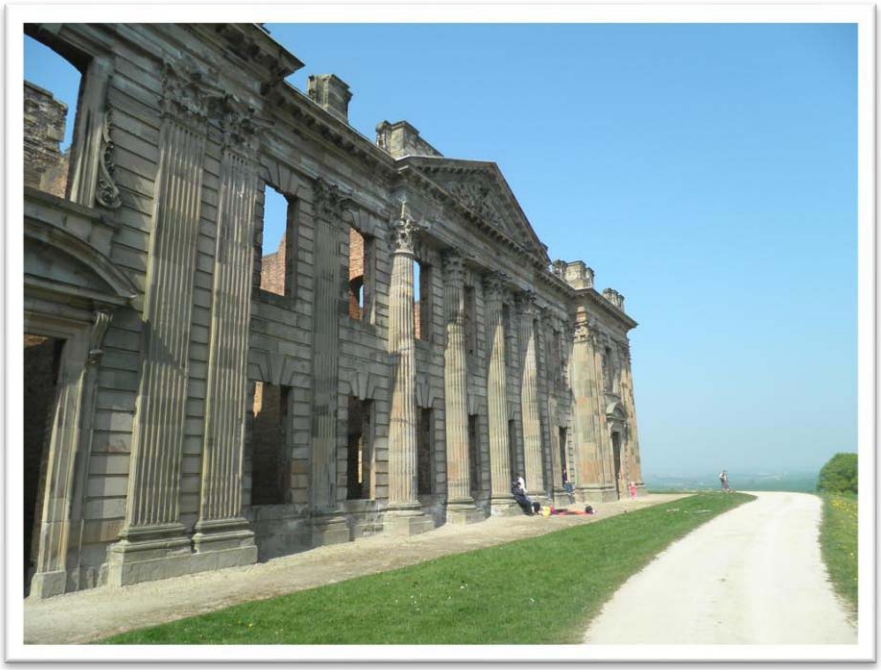
4.1 Historic Assets recorded in the NMR and HER

There were three heritage assets located within the 1.9km^2 development area. These show that there is some potential for both Neolithic and Romano-British. These isolated find spots are summarised in the below table:

UID	NAME	MONTYPE	SUMMARY
MDR6021	Late Neolithic/Early Bronze Age flint knife, south of Roseland Wood, Stony Houghton	FINDSPOT	Flint knife collected by L B Cooper and C R Hart whilst field-walking
MDR6007	Neolithic/Bronze Age Flints, south of Roseland Wood, Scarcliffe	FINDSPOT	Neolithic/Bronze Age flints found by L B Cooper in 1978
318192	Roman pottery	FINDSPOT	

There is also a crop mark site (UID 1345762) of possibly Romano British or Prehistoric date 91m outside of the south eastern corner of the site boundary. This ditched enclosure is visible on aerial photographs and has been ploughed out so no extant earthworks are currently visible. In addition to this a rectilinear enclosure of Romano British or late Iron Age date was also identified on aerial photography. There is clearly some potential for surviving below ground evidence of prehistoric and Romano British Activity although this is likely to have been truncated by ploughing in the medieval, post medieval and modern periods.

Within 5km of the development there are numerous historic assets including a Roman Villa 3km to the south east and Stainsby defended Manorial complex 4km to the south west. These are both Scheduled Ancient Monuments (see below). There is also much well known evidence for prehistoric and Romano British occupation along the ridge.



There is also considerable surviving evidence of industrial activity, relating mainly to the extraction of coal. In particular Pleasley Colliery is located 2.5km south of the development site and elements of this are protected as a Scheduled Ancient Monument.

4.2 Listed Buildings

There are nine listed buildings within 1km of the application area. There are no Grade I listed buildings and the highest grade is the church of St Leonard which is designated grade II*. There is potential for significant impact upon the setting and context of these listed buildings. In particular Hall Farmhouse and Glapwell lane house are in close proximity to the development and their setting would be impacted upon by the proposed development.

UID	NAME	STATUSDATE	GRADE
DDR1265	HALL FARMHOUSE	29/03/1995	II
DDR1263	CHURCH OF ST LEONARD	24/02/1996	II*
DDR1369	THE BOTHY AT GLAPWELL NURSERIES	31/02/73	II
DDR1261	LILAC FARMHOUSE	29/05/1957	II
DDR1271	GLAPWELL LANE HOUSE	24/02/1996	II

4.2 Scheduled Ancient Monuments

There are no Scheduled Ancient Monuments within 1km of the development site, however in the 5km buffer area surrounding the site there are 15 SAMs. The most prominent of these are the well known properties at Bolsover Castle, Hardwick Hall, and Sutton Scarsdale Hall.

UID	Name	Easting	Northing
13270	Bolsover Castle: eleventh century motte and bailey castle, twelfth century tower keep castle and seventeenth century country house.	447084.25266200000	370642.79408200000
NT 43	Roman villa ESE of Northfield House	452488.40502600000	364564.92938700000
DR 96	Four watchtowers SW of town	447164.03037900000	370441.27071200000
DR 95	Medieval town defences, 183m south east of church of St Mary and St Lawrence, and 335m north east of Bolsover Castle	447362.77365400000	370804.66851600000
23372	Standing cross on Church Street, Mansfield Woodhouse	453991.42100000000	363373.64700100000
DR 96	Four watchtowers SW of town	447340.60266700000	370252.28372300000
DR 95	Medieval town defences, 183m south east of church of St Mary and St Lawrence, and 335m north east of Bolsover Castle	447600.29830200000	370217.93604300000
DR 96	Four watchtowers SW of town	447455.45466200000	370115.87776100000
DR 231	Sutton Scarsdale Hall	444238.32800900000	368917.92164000000
21660	Pleasley Colliery	449863.25630800000	364354.89441200000
29896	Stainsby defended manorial complex including site of chapel	444902.03579200000	365633.59114000000
29895	Hardwick Old Hall: an Elizabethan great house	446173.24976800000	363663.05354000000
13239	Langwith Cave	451801.82176300000	369498.40600800000
DR 96	Four watchtowers SW of town	447559.75157600000	369983.49407900000

While not in proximity to the development site each of these well known post medieval residences falls within the zone of theoretical visibility. The potential for impacts to the settings of each of these assets shold be considered as part of the EIA. This is particularly important when considering that these great houses where designed to be seen in the landscape and elements where intended to be inter-visible with each other.

4.3 Potential for impacts to setting of key Listed Buildings and SAMs

Bolsover Castle and town defences

While Bolsover falls within the ZTV the development site itself will most likely not be directly visible. This is due to the urban development of Bolsover itself. All the terraces and views at Bolsover are designed to look westwards into the valley and beyond. As a result this aspect of the setting will not be much altered by the development. Likewise those looking towards Bolsover from the west from the valley bottom would only be able to see the tops of turbines as this is partly outside of the ZTV. However the potential for impacts to the setting will require consideration as part of the EIA.

In addition to this the east and south facing rooms in the tower, part of the "Little Castle", face towards the development site and the impact assessment will need to consider whether turbines would be visible from these locations. The area surrounding the Castle has much changed since the medieval and post medieval periods, however elements of the historic landscape still survive and the potential for the introduction of wind turbines affect the setting and visual experience of visitors should be considered as part of the EIA.

There are also four watchtowers, in reality late medieval conduit houses, located to the south of Bolsover, that roughly follow the line of the medieval town defences along the escarpement. These would all look out on the development site and the original views (though unintentional from these utilitarian structures) taking in medieval deer park and looking towards Hardwick Hall and Old Hardwick Hall. As a

result the original setting would also be impacted upon by the development of the wind turbines.

Sutton Scarsdale Hall

The remains of Sutton Scarsdale Hall are located approximately 5 km to the east of the development site where it occupies a prominent position on the opposite side of the valley to Bolsover. While the setting of the hall is not likely to be severely affected by the introduction of the turbines into the landscape due to the distance of the proposed development from the Hall, there is potential for the designed vista to the east to be altered during the operational phase of the scheme and this would require assessment as part of the EIA.

Hardwick Hall and Old Hardwick Hall

The houses and parkland at Hardwick occupy a prominent location along the ridge. It is likely that any significant development would be visible from the parkland and designed landscape surrounding the hall. There are designed views from the main avenue to the east of the hall and on the approach to the north east. Both of these would be interrupted by the proposed development. The development would also be visible from the upper storeys and roof of Hardwick Hall, which were designed to look out over the parkland. This is particularly true of a roof terrace designed for taking in the views. Though currently not accessible to visitors, if this were to be opened in the future the intended vista would be much altered by the proposed development.

Stainsby Manor and Northfield House Roman villa

These sites both consist of buried archaeological remains; as a result they would be little altered by the development. Although some elements of early landscape survive later development has already changed the setting of these monuments.

4.4 Conservation areas

The conservation areas of Palterton, Stony Houghton and Scarcliffe, are all within 1km of the site. These are also the locations of all the listed buildings mentioned above, with the exception of the Bothy at Glapwell nurseries and Glapwell Lane house. In addition to these Pleasley Park is within 5km of the site. The potential for the setting of these conservation areas to be impacted upon by the proposed development should be considered as part of the EIA.

5. Map Regression

5.1 Pre Ordnance survey mapping

A tithe map of 1850 shows the land as enclosed fields with woodland to the north. This is little changed from what is visible on the later Ordnance Survey maps.

5.2 1:10590 series Ordnance Survey maps (1887 – 1990s)

Historic Ordnance survey Mapping shows the site relatively unchanged between 1887 and the 1990s. The major changes are some simplification of the original enclosure boundaries and some forestry activity in the 1940s and 50s. The latter of these presumably relates to logging as part of the war effort.

5.3 1:2500 series Ordnance Survey maps (1877-1990s)

This demonstrates the same story as the larger scale maps with little change taking place throughout the post 19th and 20th centuries.

6. Historical and Archaeological Background

6.1 Context

The site proposed for future development of six wind turbines is located in proximity to several important historic sites. These include the historic residences of Hardwick Hall, Bolsover Castle and Sutton Scarsdale Hall, all within 5km as discussed above. There is evidence for Prehistoric and Romano British occupation within 1km of the development although this is limited to a few find spots within the site boundary.

6.2 Early Prehistory (c. 10,000 – 2500 BC)

There is evidence for isolated find spots of Mesolithic worked flint in the vicinity and several scatters are located within the site boundary. There is further evidence for Neolithic and Early Bronze Age activity, seen from two find spots within the development site boundary, one of a flint knife and a second of more worked flints. There is evidence in the wider environment for prehistoric activity along the raised ridge the development site is located on and therefore there may be potential for surviving below ground remains.

6.3 Iron Age (c. 800 BC – AD43)

There is no artefactual evidence to suggest Iron Age activity however two enclosures visible as crop marks may date to this period. One of these, located to the south east of the development contains the crop mark of a possible round house. There is no other Iron Age evidence proximal to the site. There is also a suggested crop mark enclosure to the east of Roseland Wood visible on aerial photography from 1977 which could date to the Iron Age. This falls within the North eastern extent of the development site. There are several other crop mark complexes to the south of the development all within 1km, demonstrating later prehistoric and possibly Romano British activity in the vicinity.

6.4 Romano British period (c. AD 43 – AD 410)

There is a find spot of a single piece of Romano British Pottery within the development boundary. However this may have been moved here by the plough over time. The three crop marks mention above may also relate to small Romano British settlements after the Iron Age. The location of a Roman Villa 3km to the south east indicates Roman activity in the area and the Rotherham road that runs through the site may have its origins as a minor Roman road.

6.5 Early Medieval / Anglo Saxon period (c. AD 410 – 1066)

There is no evidence for early medieval or Anglo Saxon activity in the vicinity of the development site.

6.6 Medieval period (1066 — c.1500)

The medieval settlement of the area is apparent in the settlement and development of the castle and later town at Bolsover and the villages surrounding the site boundary such as Palterton which appear to have medieval origins. There is also a possibility that Roseland Wood and some of the fields to the south of it form part of a medieval deer park. This is no longer thought to be the case and was based on a Medieval licence to impark. There is still however low potential of medieval

archaeology in the vicinity.

6.7 Post Medieval period (1500 – c.1900)

In the post medieval period the enclosure of the fields and resultant heavy ploughing accounts for the landscape as seen now. This will have most likely truncated any features that survived below the surface. In the wider landscape the main developments in the post medieval period where the establishing of the major private residences at Hardwick Hall, Bolsover and Sutton Scarsdale. These grand houses and the parkland and gardens surrounding them will have dominated the landscape during this period. With woodland walks such as Lady Spencer's walk at Hardwick and the terraces with grand vistas seen at Sutton Scarsdale and Bolsover were intentionally designed to view the surrounding lands. The houses were also designed to be inter-visible and make a statement on the landscape, demonstrating the families influence and wealth.

Hardwick Hall, built between 1590 - 97 is particularly significant as it was home to Bess of Hardwick the second wealthiest woman in England in Elizabethan England. It is also notable as it was an unconventional building for the 16th century, with extensive use of glass windows. It is one of the best preserved and significant examples of a 16th century country house. As a result the setting of the house and elements of the deer park, designed landscape and vistas are equally important. Intended views from the woodland walks, driveways, roof terraces and gardens are all equally significant.

There is also evidence of extensive exploitation of the coal resource within 5km of the development site, Pleasley colliery is a well preserved and significant example with remains of the engine house, chimney and head stocks. The extraction of coal is significant in the context of the later settlement and development of the area surrounding the development site, although there is no evidence of surviving remains in close proximity to or within the site boundary.

6.8 Previous archaeological research and intervention

A previous Desk Based Assessment and Evaluation where undertaken proximal to the current development, at Losk Lane. The evaluation uncovered no surviving archaeological features. The DBA did reveal crop mark evidence of a possible Romano British rectilinear enclosure.

7. Discussion and Conclusions

7.1 Assessment of potential

The site itself has low archaeological potential for surviving below ground remains. Although there is evidence for prehistoric and Romano British archaeology in the area, seen from isolated finds and crop mark evidence, below ground remains will have most likely been truncated by centuries of ploughing. This could also account for the scatter of flint finds within the development site. There is low potential for better surviving remains, as can be seen from the crop mark evidence. However geophysical survey has revealed several features of archaeological potential that may require further investigation.

7.2 Setting and Context

The potential for the setting of important historic assets such as Hardwick Hall and Bolsover Castle to be impacted upon by the development and should be considered as part of the EIA. Consultation with interested parties including the English Heritage inspector of ancient monuments (Jon Humble) is recommended. The apparent visual impacts on setting are summarised in the table below.

The post medieval settlement of the area is considered a key research theme and is of special interest as there are so many grand post medieval houses within such as small area. The potential for the proposed development to impact upon the setting and context of these monuments as a group as well as individually should be considered.

7.3 Conclusions

Below ground archaeology within the footprint of the turbines is likely to be localised in small areas or heavily truncated by ploughing. This will most probably be Later Prehistoric or Romano British, although there is limited evidence to suggest Mesolithic activity as well. This could be mitigated with a small programme of archaeological works as described below.

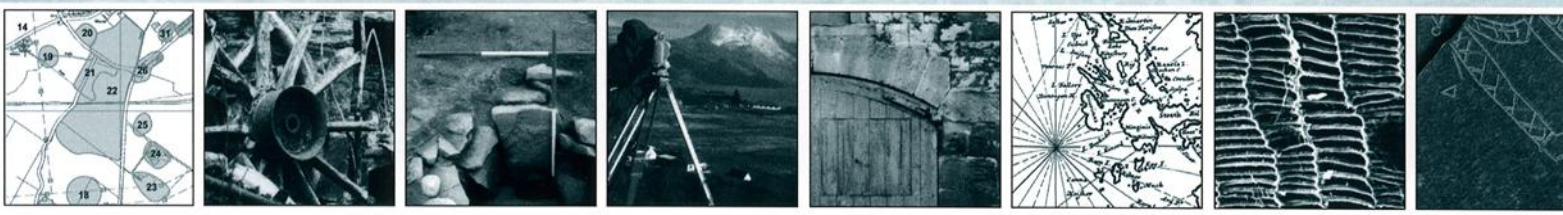
7.4 Further work

There will most likely be a requirement for further archaeological evaluation trenching within the footprint of each turbine to assess the below ground survival of archaeological remains. This should take the form of a small targeted programme of trenching based on the geophysical survey. The results of this evaluation will allow preservation of any below ground remains through record if necessary. This will also avoid the requirement for a costly watching brief during the excavation of foundations.

8. Recommendations

- Determine a programme of targeted archaeological evaluation at the location of each of the wind turbines in consultation with the Derbyshire Development Control Archaeologist. This should be based on the results of this DBA and geophysical survey.
- Take all necessary steps in consultation with English Heritage to ensure the final scheme design seeks to minimise the potential for impacts to key heritage assets, in particular, Hard Wick Hall, Bolsover Castle and Sutton Scarsdale.
- The EIA should consider the potential for the proposed development to affect the settings of key heritage assets including Grade I listed buildings. A Study area of 5 km is advised.
- The proposed development should consider possible impacts upon nearby Conservation Areas including Stony Houghton, Scarcliffe and Palterton.
- The proposed development should consider possible impacts upon proximal listed buildings including those at Scarcliffe, Stony Houghton, Glapwell and Palterton.

Appendix 12.2: Headland Archaeology Geophysical Survey Report



A Magnetic Gradiometer Survey of Turbine Locations at a Windfarm Development, Roseland Wood, Shirebrook, Derbyshire

Client: ECUS Limited

Contractor: Headland Archaeology (UK) Ltd.

Author: Scott Harrison

Date: 01.06.11

HEADLAND ARCHAEOLOGY Ltd

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Statement of Indemnity

Geophysical survey, both fluxgate gradiometry and resistance survey, rely on observations about the physical properties of the archaeological remains they attempt to locate. Through experience it becomes possible for geophysicists to identify features with reasonable accuracy, by the physical trace left behind. It must be noted, however, that geophysical interpretation is a subjective science and all hypotheses offered should not be treated as the unequivocal truth until tested and proven by further intrusive investigation.

Client Document

1 Introduction

This report details the results of a magnetic gradiometer survey of the proposed locations of six wind turbines, as part of a proposed windfarm development in Roseland Wood, Shirebrook, Derbyshire. The footprint of the development lies entirely within land that forms part of the Chatsworth Estate.

2 Aims and Objectives

The aims of this survey area to:

- identify any geophysical anomalies indicative of possible sub-surface archeological features, within the specified survey areas
- accurately locate these anomalies and present the findings in map form
- Provide a written report describing the possible sub-surface archaeological features identified during the course of the survey and discussing their likely provenance

3 Site Discussion

3.1 Site Location

The windfarm is located on the crest of a hill, immediately south of Roseland Wood and west of Roseland Farm. The centre of the proposed development area is situated at NGR 367385, 449878, north of the village of Stoney Houghton and east of the town of Shirebrook, which is overlooked by the site.

- Turbine 1 (449225, 367095) was located on flat land, which was under cereal cultivation at the time of the survey.
- Turbine 2 (449630, 367030) was located on flat land, which was under cereal cultivation at the time of the survey.

- Turbine 3 (450030, 366960) was located on a gently north/south orientated slope, which was under mature oilseed rape at the time of the survey. Because the crop was nearing maturity, this precluded survey in this location.
- Turbine 4 (450070, 367400) was centred on a small hillock, located upon a general north/south sloping trend, which was under cereal cultivation at the time of the survey.
- Turbine 5 (450530, 367400) was located on a relatively steep east/west orientated slope, which was under cereal cultivation at the time of survey.
- Turbine 6 (450480, 367810) was located on flat land, which was under mature oilseed rape at the time of the survey. Because the crop was nearing maturity, this precluded survey in this location.

3.3 Site Geology

The bedrock geology typically consists of dolomitised limestone and dolomite of the Zechstine group, overlain by clay deposits. Generally, soils that overlay limestone deposits are amenable to geophysical survey, and it is apparent that this is the case in this instance.

4 Description of the Proposed Works

A geophysical survey was required that encompassed the footprint of each turbine. To this end, each survey area comprises a 120m x 120m (1.44 Ha), north/south orientated square, centred on each of the turbine locations. Magnetic gradiometry was used to ensure swift coverage and to identify the widest range of potential anomalies.

5 Results

5.1 Turbine 1

1L1	Possible Pit?
1L2	Possible Pit?
1L3	Possible Pit?
1L4	Possible Pit?
1L5	Possible Pit?
1L6	Possible Pit?
1L7	Possible Pit?
1L8	Possible Pit?
1L9	Possible Pit?
1M1	Field Boundary?
1M2	Field Boundary?

Anomalies 1M1 and 1M2 are orientated south-west/north-east and north-west/south-east, respectively. Each anomaly transects the entire survey area. It is likely that these anomalies are derelict field boundaries. Possible pits of unknown derivation 1L1 – 1L9 are generally concentrated in the southern half of the Turbine 1 survey area.

5.2 Turbine 2

2L1	Possible Pit?
2L2	Possible Pit?
2L3	Possible Pit?
2L4	Possible Pit?
2L5	Possible Pit?
2L6	Possible Pit?
2L7	Possible Pit?
2L8	Linear - Possible Field Boundary?
2L9	Possible Pit?
2L10	Possible Pit?
2M1	Field Boundary?
2M2	Field Boundary?
2M3	Field Boundary?
2M4	Field Boundary?
2M5	Field Boundary?
2M6	Linear - Possible Trackway?
2M7	Linear - Possible Trackway?
2M8	Linear - possible Trackway?
2M9	Linear - Possible Trackway?
2M10	Field Boundary?

Anomalies 2M1 – 2M5 and 2M10 are orientated in various directions and are irregular in appearance and likely to be field boundaries. Their irregularity may indicate that they represent a relatively early field system, and if this is the case it is possible that they date from before the early modern period (pre 1750). Due to the absence of supplementary evidence it is not possible to be any more specific. In the south-east of the survey area there are a series of parallel, linear anomalies (2M6 – 2M9). It is possible that these form some kind of trackway, or regularly used path. As this is an agricultural context, it is possible that this is merely a regularly used tractor path, rather than anything of archaeological significance.

Possible pits 2L1 – 2L7, 2L9 and 2L10 are concentrated in the southern half of the survey area and are of uncertain derivation. Anomaly 2L8, a very diffuse linear anomaly is possibly the remnant of a derelict field boundary.

5.3 Turbine 4

4L1	Possible Pit?
4L2	Possible Pit?
4L3	Possible Pit?
4L4	Possible Pit?
4L5	Possible Pit?
4L6	Possible Pit?
4L7	Possible Pit?
4L8	Possible Pit?
4L9	Possible Pit?
4M1	Enclosing Feature - Related to Adjacent Pheasant Shoot?
4M2	Enclosing Feature - Related to Adjacent Pheasant Shoot?
4M3	Diffuse Linear - Agricultural?
4M4	Diffuse Linear - Agricultural?
4M5	Diffuse Linear - Agricultural?
4M6	Linear - Possible Field Boundary?
4M7	Linear - Possible Field Boundary?
4M8	Irregular - Uncertain Derivation?
4H1	Enclosing Feature - Uncertain Derivation

Possible pits of uncertain derivation 4L1 – 4L9 are distributed throughout the survey area. Anomalies 4M1 and 4M2 are linear features for the most part orientated parallel to the eastern edge of Roseland Wood. These ditch-like, anomalies could possibly have been enclosing features relating to the wood itself. Diffuse linear anomalies 4M3 – 4M5 are orientated generally east/west. Their provenance is uncertain, but they may be agricultural in origin. Linear anomalies 4M6 and 4M7 are possibly related and it is likely that they are derelict field boundaries. Irregular positively magnetic anomaly 4M8 is likely to be significant being situated at the highest point of the hillock, on which the Turbine 4 survey area is located. The most significant anomaly identified during the project is anomaly 4H1. It is a large (25m x 17m), curvilinear anomaly, with a 16m 'break' in the east of the site. There is nothing definitive that can be said about the provenance of this anomaly without intrusive investigation, but there is a strong possibility that it represents some form of sub-circular enclosure or other prehistoric structure.

5.4 Turbine 5

5L1	Variable Anomaly - Uncertain Derivation
5L2	Variable Anomaly - Uncertain Derivation
5L3	Linear Anomaly - Possible Tractor Ruts?
5L4	Possible Pit?
5L5	Possible Pit?
5L6	Possible Pit?
5L7	Possible Pit?
5L8	Possible Pit?

5L9	Possible Pit?
5L10	Possible Pit?
5L11	Possible Pit?
5L12	Possible Pit?
5L13	Possible Pit?
5L14	Possible Pit?
5L15	Possible Pit?
5L16	Variable Anomaly - Uncertain Derivation
5M1	Linear - Agricultural?
5M2	Linear - Agricultural?
5M3	Linear - Agricultural?
5M4	Linear - Agricultural?

Anomalies 5L1, 5L2 and 5L16 are all large, sweeping, variable anomalies that are likely to be related. They are of uncertain derivation. Anomaly 5L3, is located adjacent to the eastern boundary of the field and despite its diminutive appearance, it is fairly typical of a heavy tractor rut. Anomalies 5L4 - 5L15 are fairly evenly distributed throughout the site. They are all possible pits of uncertain derivation. Anomalies 5M1 – 5M4 are all orientated south-west/north-east or north-west/south-east and they appear to be orientated generally perpendicular to each other. It is likely that they are agricultural in origin and it is possible that they are derelict field boundaries.

6 Conclusions

Throughout the course of the survey, it became apparent that the vast majority of the anomalies are agricultural in origin. This is to be expected as it is generally accepted that the farmland at this location is of high quality and suitable for arable crops. The most significant of these anomalies are the series of anomalies that form the 'possible' irregular field system within the Turbine 2 survey area.

There are also anomalies in the vicinity of proposed Turbine 4, which are likely to be significant, namely 4M8 and 4H1. Anomaly 4H1 is possibly evidence of habitation and if this is the case, it is likely to be prehistoric in origin. Anomaly 4M1 is of uncertain derivation, but its location at the crest of a small hillock, suggests that it might be significant. It is possibly related to anomaly 4H1.

Unfortunately, due to mature oilseed rape plants, it was not possible to survey the proposed locations of both turbine 3 and 6.

Technical Information

8 Methodology

8.1 Legislative Framework and Guidelines

Headland Archaeology (UK) Ltd. conducts geophysical surveys to the highest professional standards, as detailed in *Geophysical Survey in Archaeological Field Evaluation*, English Heritage Research and Professional Services Guideline No. 1, 2nd ed (English Heritage 2008) and *The Use of Geophysical Techniques in Archaeological Evaluations*, Institute of Field Archaeologists Paper, No. 6 (IfA 2002).

All data provided by Headland Archaeology (UK) Ltd., will be treated in accordance with the guidelines laid out in *Geophysical Data in Archaeology: A Guide to Good Practice* (AHDS Guides to Good Practice: Schmidt 2001).

A site specific Health and Safety Risk Assessment and Method Statement was produced and circulated to all relevant parties for approval. All survey personnel were required to sign this document before the commencement of any works.

8.2 Phase I: Magnetic Gradiometry

To conduct the survey, we used a cart-mounted Bartington Grad 601-2 dual magnetic gradiometer, linked with a Differential Global Positioning System (dGPS), capable of Real Time Kinematic (RTK) navigation (±0.02m accuracy). This allowed the location of each data point to be accurately recorded and negated the need to set out a nominal grid prior to the survey, thereby increasing the accuracy and efficiency of the survey.

The magnetometer data and the GPS data was collected at a resolution of *at least* 1m x 0.125m and combined in real-time using the data collection software. This sample density is acceptable, 'for evaluation surveys, where the primary goal is to establish the presence or absence of archaeological remains' (English Heritage 2008).

This 'irregular xy' data was exported from the data collection software and imported in to our processing software where it was converted to 'regular xy' data at user defined sample intervals (1m x 0.125m, in this case). From there it is processed as standard magnetometer data, in the same way as data collected from traditional pre-defined grid survey.

8.4 Phase II: Reporting and Data Archive

Once the magnetic gradiometer data was processed to highlight and clarify any anomalies that may be archaeologically derived, the data was exported as ASCII grid files. These ASCII files perform the dual function of fulfilling all archive requirements, as they can be opened and edited in any text

editor, while at the same time, being inherently spatially aware and therefore being able to be opened directly in CAD/GIS software.

CAD/GIS software was used to create the illustrations. The interpretations were be produced *in situ* and exported as both GIS shapefiles and CAD DXFs to ensure compatibility with other spatially aware data produced during the scheme.

11 References

English Heritage 2008 *Geophysical Survey in Archaeological Field Evaluation*. English Heritage Research and Professional Services Guideline No. 1 (2nd ed). English Heritage, London.

Geological Survey of Ireland Public Data Viewer *http://spatial.dcenr.gov.ie/imf/imf.jsp?site=GSI_ Simple.* (April 2011)

IfA, Pending *DRAFT Standards and Guidance for Geophysical Survey*, IfA Technical Paper (IfA, Pending).

IfA, 2002 *The Use of Geophysical Techniques in Archaeological Evaluations*, Institute of Field Archaeologists Paper, No. 6.

Schmidt, A. 2001 *Geophysical Data in Archaeology: A Guide to Good Practice.* AHDS Guides to Good Practice. Oxbow Books, Oxford.

Appendix 1

Geophysical Science

The aim of geophysical science in an archaeological context is to examine an area for potential sub-surface archaeological remains, without utilising invasive methods such as test trenching or excavation. This is accomplished by examining the physical properties of the soil, specifically the contrast between the physical properties of potential archaeological features and those of the surrounding soil. These contrasts, known as anomalies, are visible in the results of the survey. The method(s) used to examine sites of archaeological potential are entirely dependent on the types of archaeological features anticipated.

Magnetic Gradiometry

Magnetic gradiometry is a means of measuring minute shifts in the earth's magnetic field caused by magnetised, iron rich minerals present in the soil. At surface level, the charges of these particles create localised variations in the recorded magnetic field of the earth. The magnetic field strength of the earth is measured in Nanoteslas (nT).

The bedrock geology and the superficial geology that underlie a survey area are key components in determining how successful a magnetic gradiometry survey will be. As the bedrock plays a pivotal role in soil formation processes, both the quantity and form of iron present within the bedrock can have a profound impact on the results of the survey. Because of this, surveys conducted on some sites are more successful, or "clearer", than those conducted on others are. However, to some degree, all sites are amenable to magnetic gradiometer survey.

In an oxidising or reducing environments, the iron rich minerals present in the soil can be "enhanced" through natural and anthropogenic forces; these compounds have undergone chemical and physical changes that affect their magnetic properties.

When iron is heated above a certain temperature, known as the Curie point (676 °C for haematite and 565 °C for magnetite), it becomes demagnetised. As it cools, it is remagnetised, acquiring a new magnetic field that is in alignment with the ambient magnetic field of the earth at that moment. This form of magnetism is called Thermo-Remnant Magnetism or TRM. As the earth's magnetic field regularly fluctuates by tens of nT (or even hundreds of times during periods of increased solar activity), this can give rise to anomalies that can have a magnitude tens of times greater than that of the baseline.

Through different, more subtle, processes chemical and physical changes can also occur through the oxidising and reducing actions of bacterial microbes that are prevalent in soils. Organic matter, soil

oxygen and soil moisture are all factors that influence this process. Anthropogenic actions, such as ploughing and the addition of organic matter to improve the structure of the soil, play a role in facilitating these reactions. These processes cause an increase in enhanced induced magnetic susceptibility, or MS and this generally equates to small increases in magnetism (several nT), visible against the background level.

These areas of TRM or MS are concentrated in areas of human activity, but more than that, these magnetised particles tend to spread far from the initial point of origin and find their way into the fills of ditches and pits. The anthropogenic spread of these minerals causes widespread magnetic enhancement across areas of human habitation and this enhancement facilitates the use of magnetic gradiometry in archaeological prospection.

Appendix 2

Archival Policy

At Headland Archaeology (Ireland) Ltd. we take our responsibility to archive geophysical data in a professional manner very seriously. As interpretive theories and computational processes improve, it is imperative that a suitable archive exists to allow others to access the data and to reinterpret it in the light of improved theories and processes.

All data provided by Headland Archaeology (Ireland) Ltd., will be treated in accordance with the guidelines laid out in *Geophysical Data in Archaeology: A Guide to Good Practice* (AHDS Guides to Good Practice) (Schmidt 2001).

In general, recipients of the data produced during a geophysical survey include, the contractor, the client and the appropriate national heritage body. All recipients will receive the following as a minimum standard:

- raw composite files in the GIS compatible .asc file format
- processed composite files in the GIS compatible .asc file format
- geophysical anomaly interpretations in GIS and CAD compatible .shp and .dxf file formats
- grid (re)location data in GIS and CAD .dxf file format
- full report text and accompanying illustrations in .pdf file format

References

Schmidt, A. (2001) *Geophysical Data in Archaeology: A Guide to Good Practice* (AHDS Guides to Good Practice), Oxbow Books: Oxford.

Appendix 3

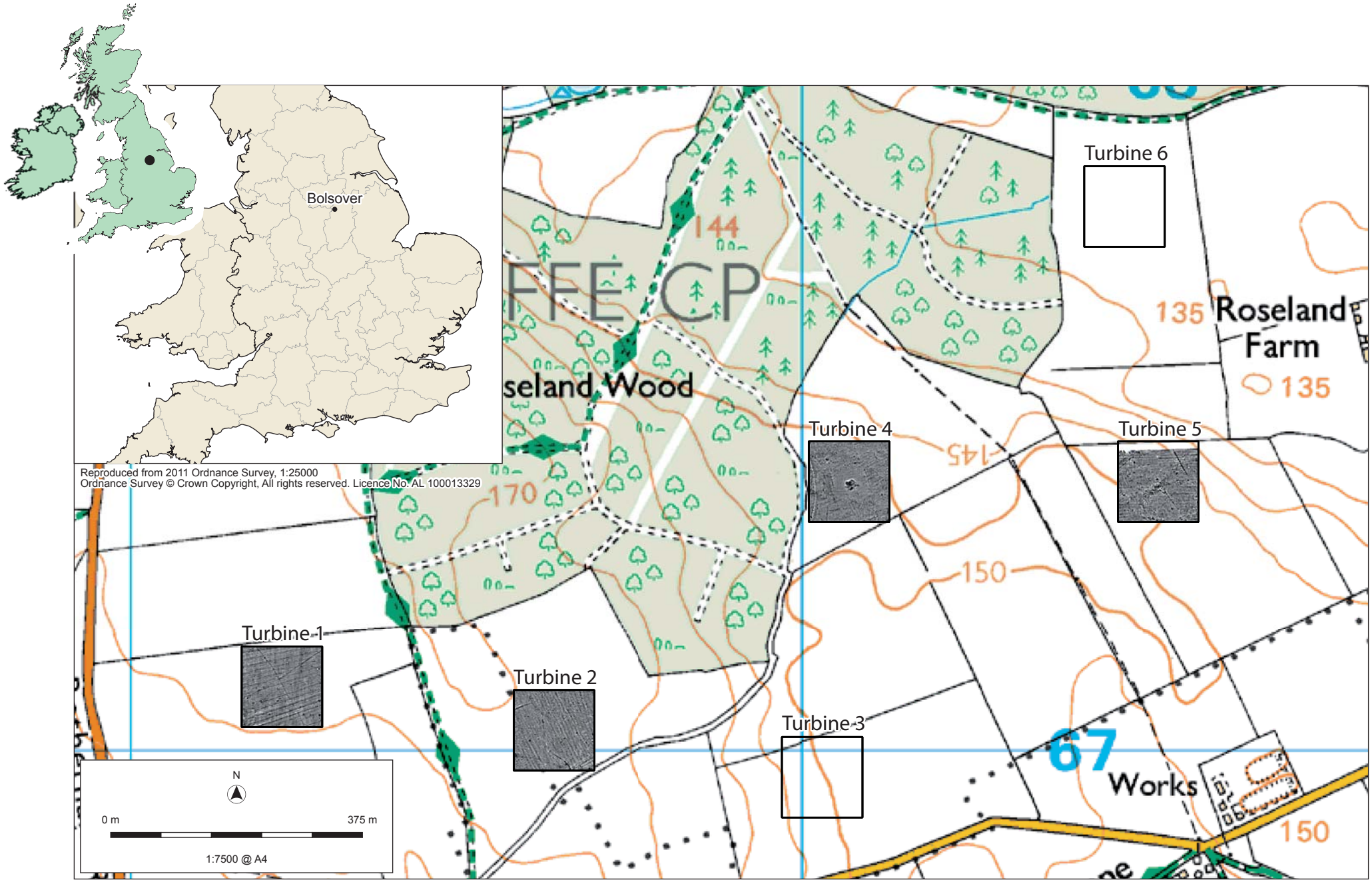
Details of Processes Applied to the Data

Clip – Clip will remove extreme values from the data set, to increases the contrast in the archaeologically significant mid-range of the data (generally -5 nT to +5 nT). This better visualises standard data sets, by accentuating weaker magnetic signals.

Destripe – Destripe will reduce/remove the striping effect sometimes known as "heading error". This error is a function of the directional sensitivity of the magnetic gradiometer sensors. It uses the GPS 'track' to differentiate one traverse from the other.

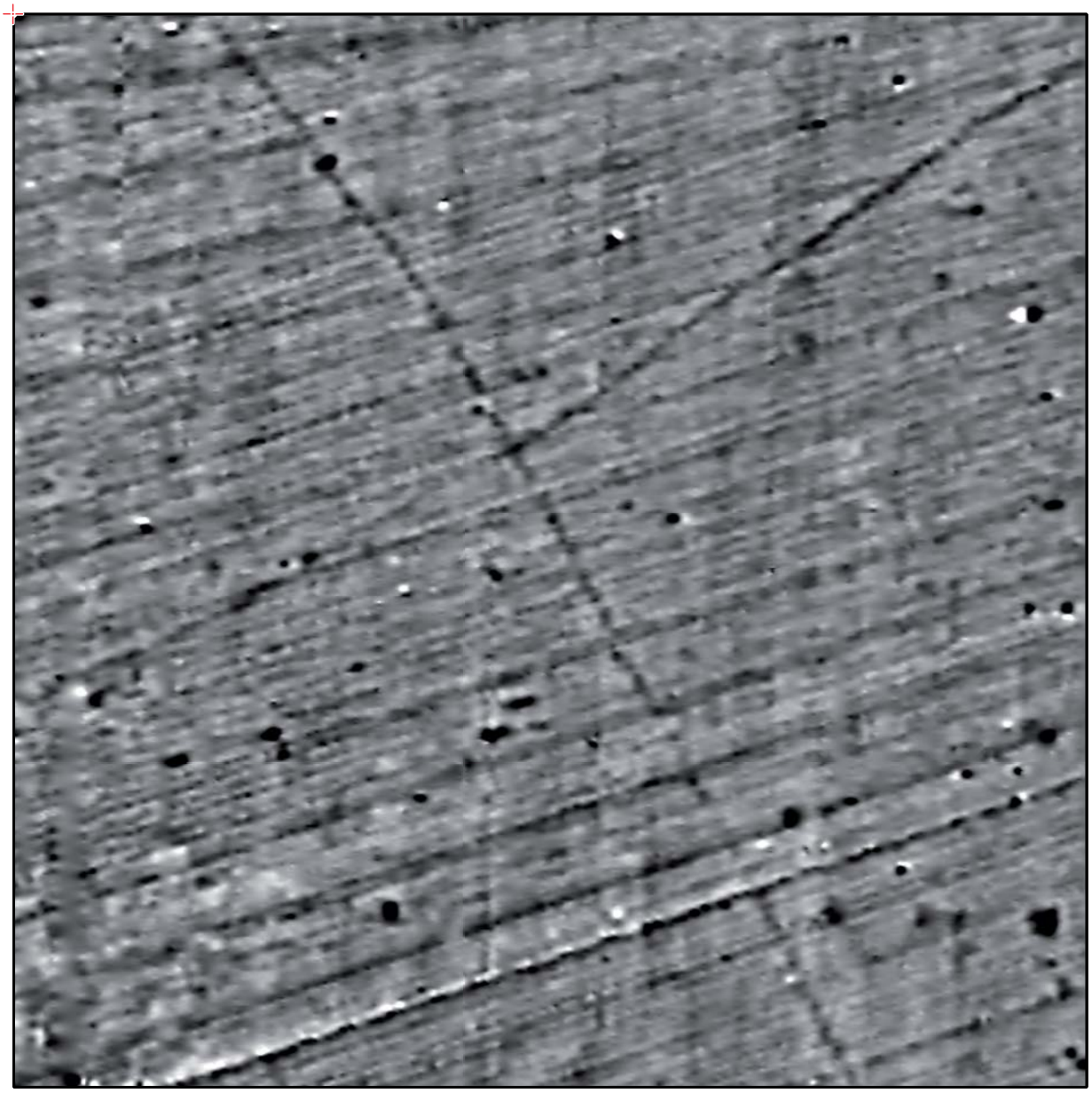
Despike – Despike will clip isolated extreme values from the data set. Extreme values are usually caused by surface iron of non-archaeological origin. In more technical terms, it removes statistical outliers from the data set and consequently removes them from any further computational processes.

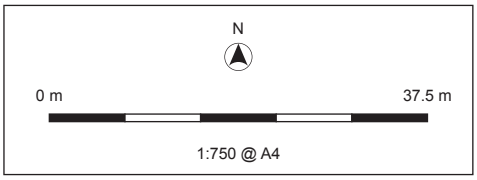
Low/High Pass Filter – Low-pass filtering is applied to highly variable datasets. The aim is to reduce the variability and reveal larger trends throughout the dataset. High-pass filtering is applied to datasets with a low variability to reduce large trends throughout the data and accentuate more subtle anomalies.



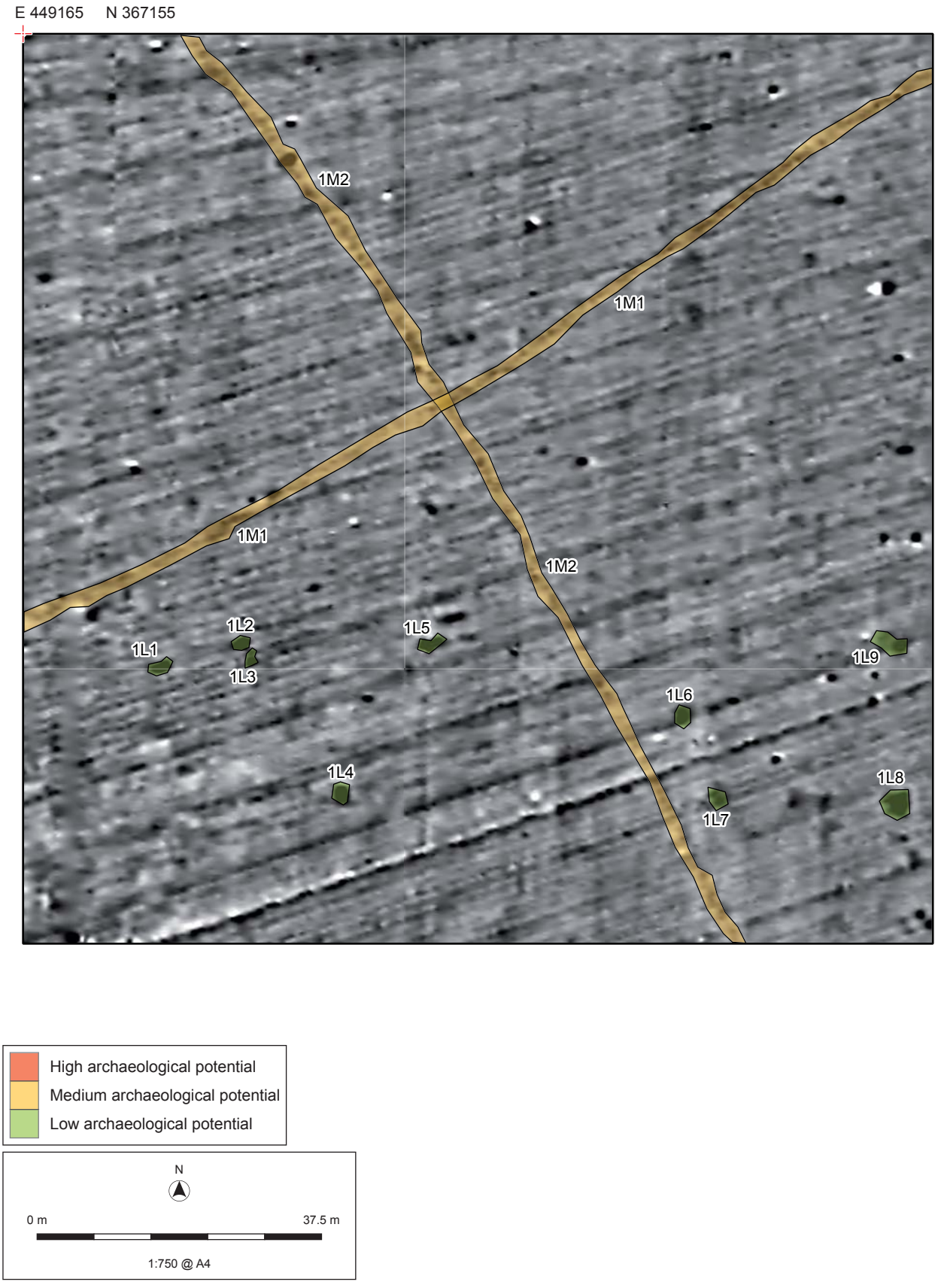
Illus 1 - Project Sunrise, Bolsover District, Derbyshire: Site location

E 449165 N 367155



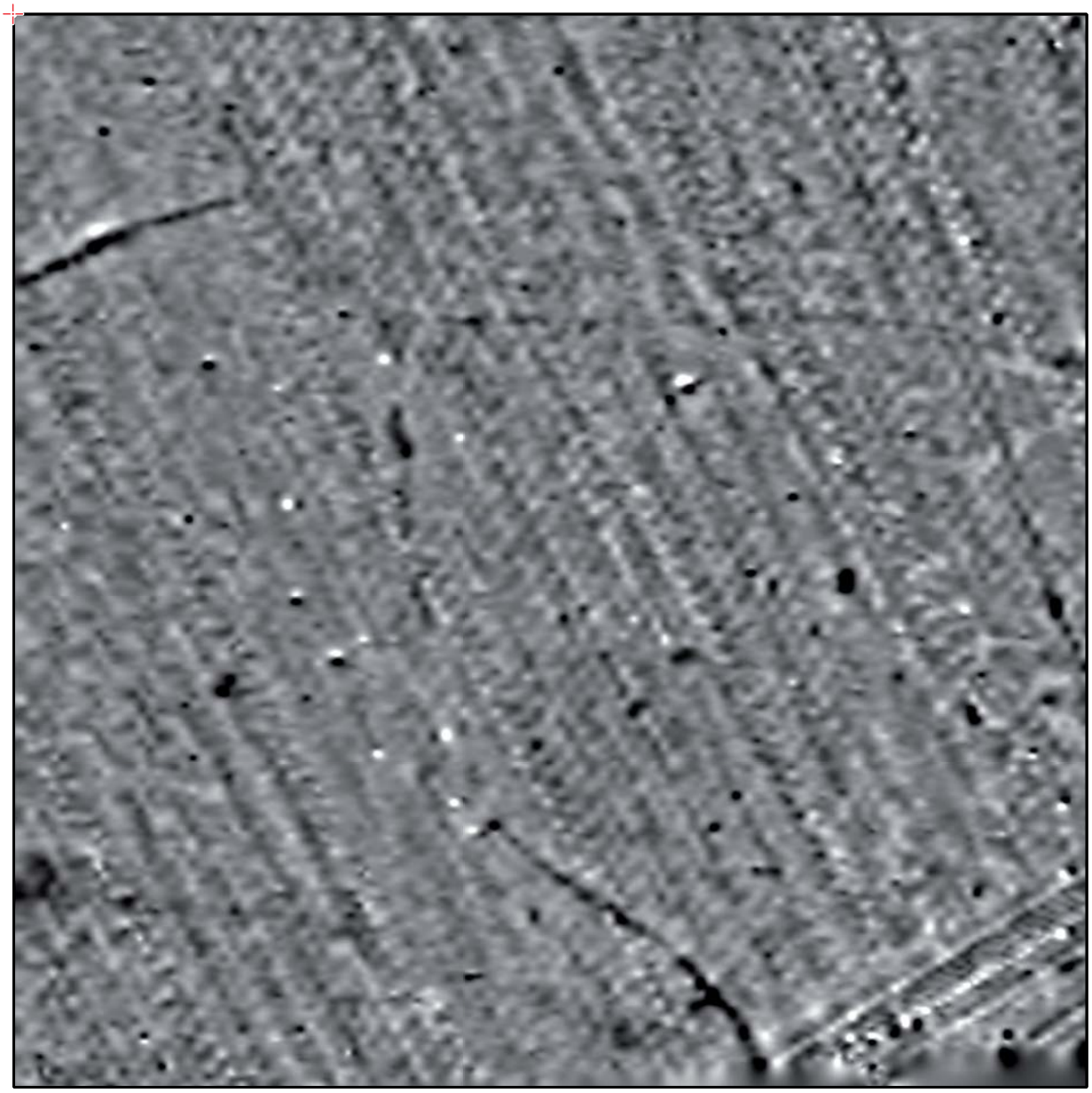


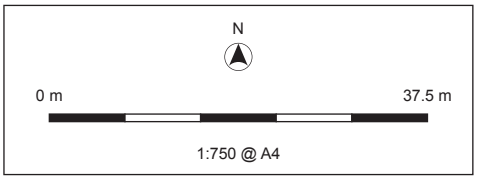
Illus 2 - Project Sunrise, Bolsover District, Derbyshire: Turbine 1



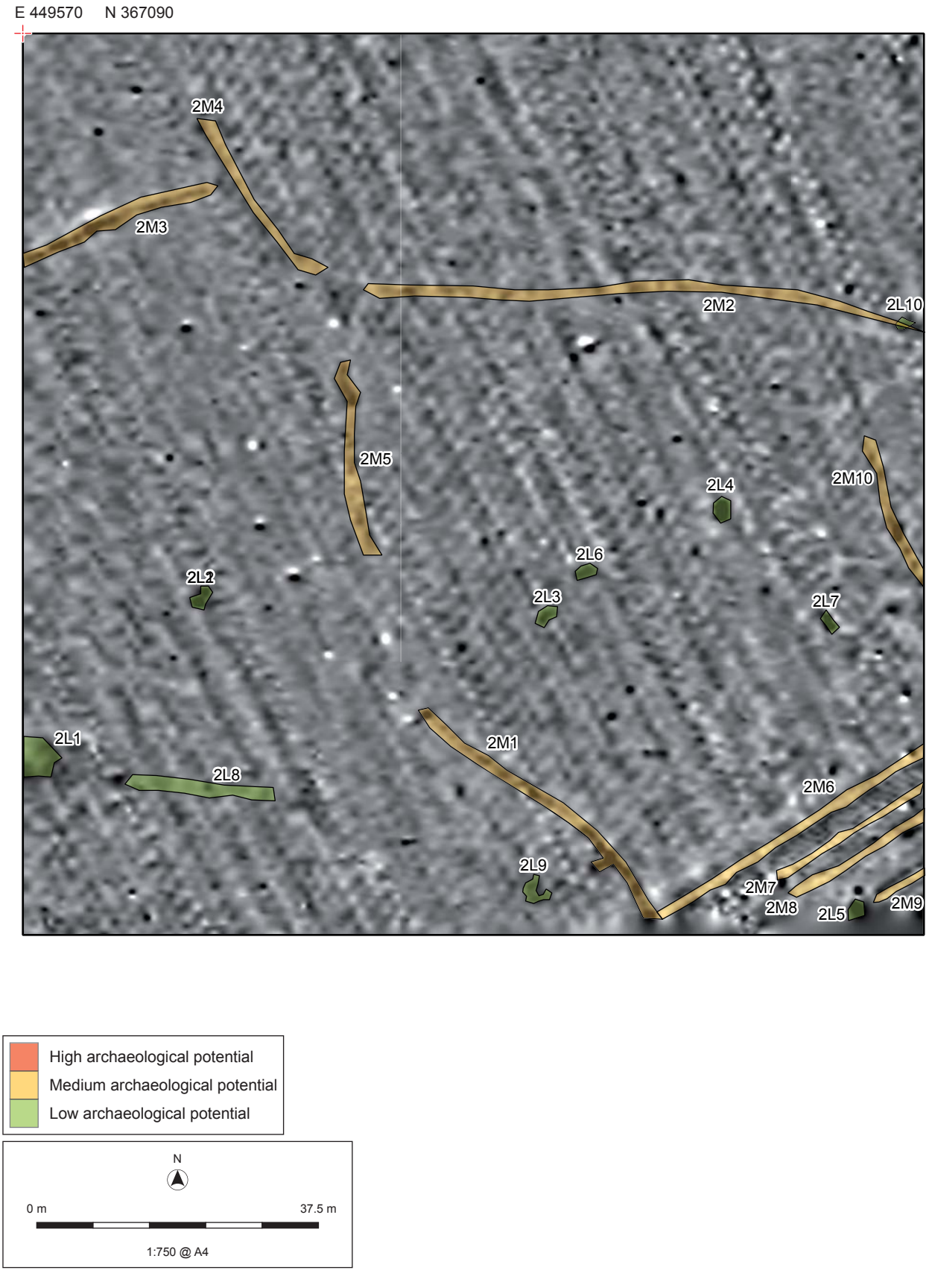
Illus 3 - Project Sunrise, Bolsover District, Derbyshire: Turbine 1, with interpretation

E 449570 N 367090





Illus 4 - Project Sunrise, Bolsover District, Derbyshire: Turbine 2



Illus 5 - Project Sunrise, Bolsover District, Derbyshire: Turbine 2, with interpretation

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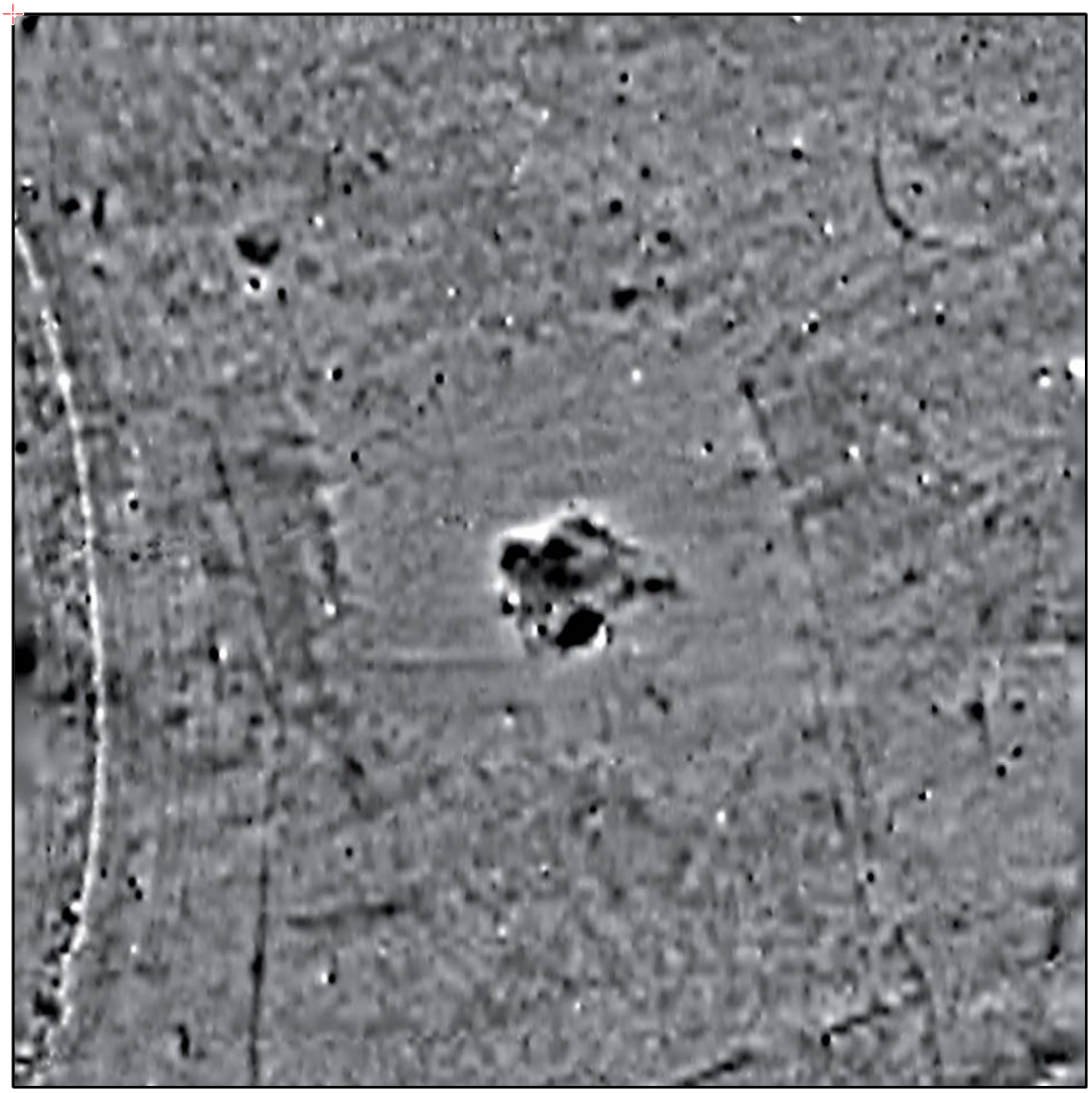
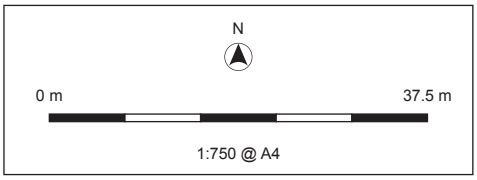
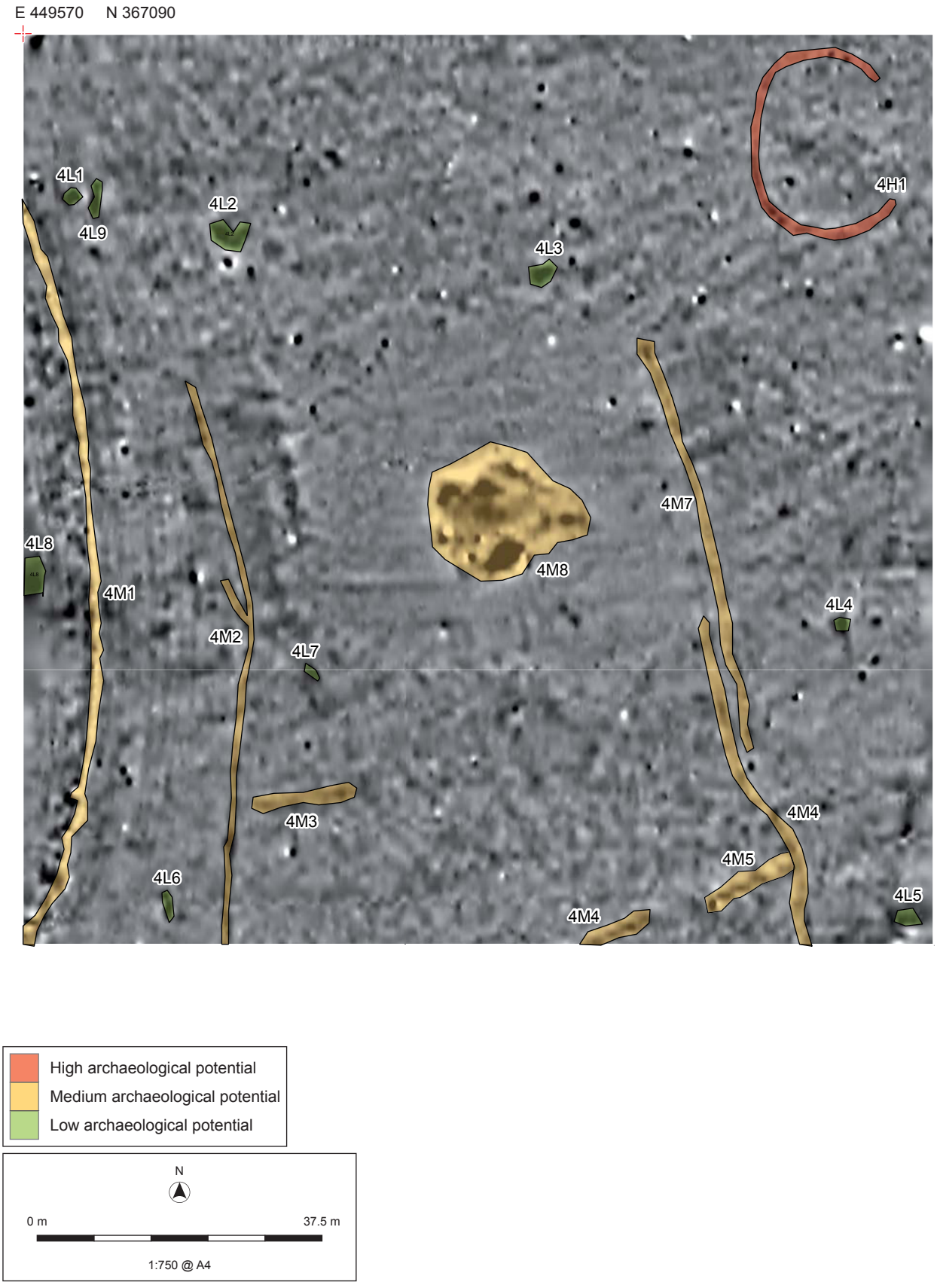
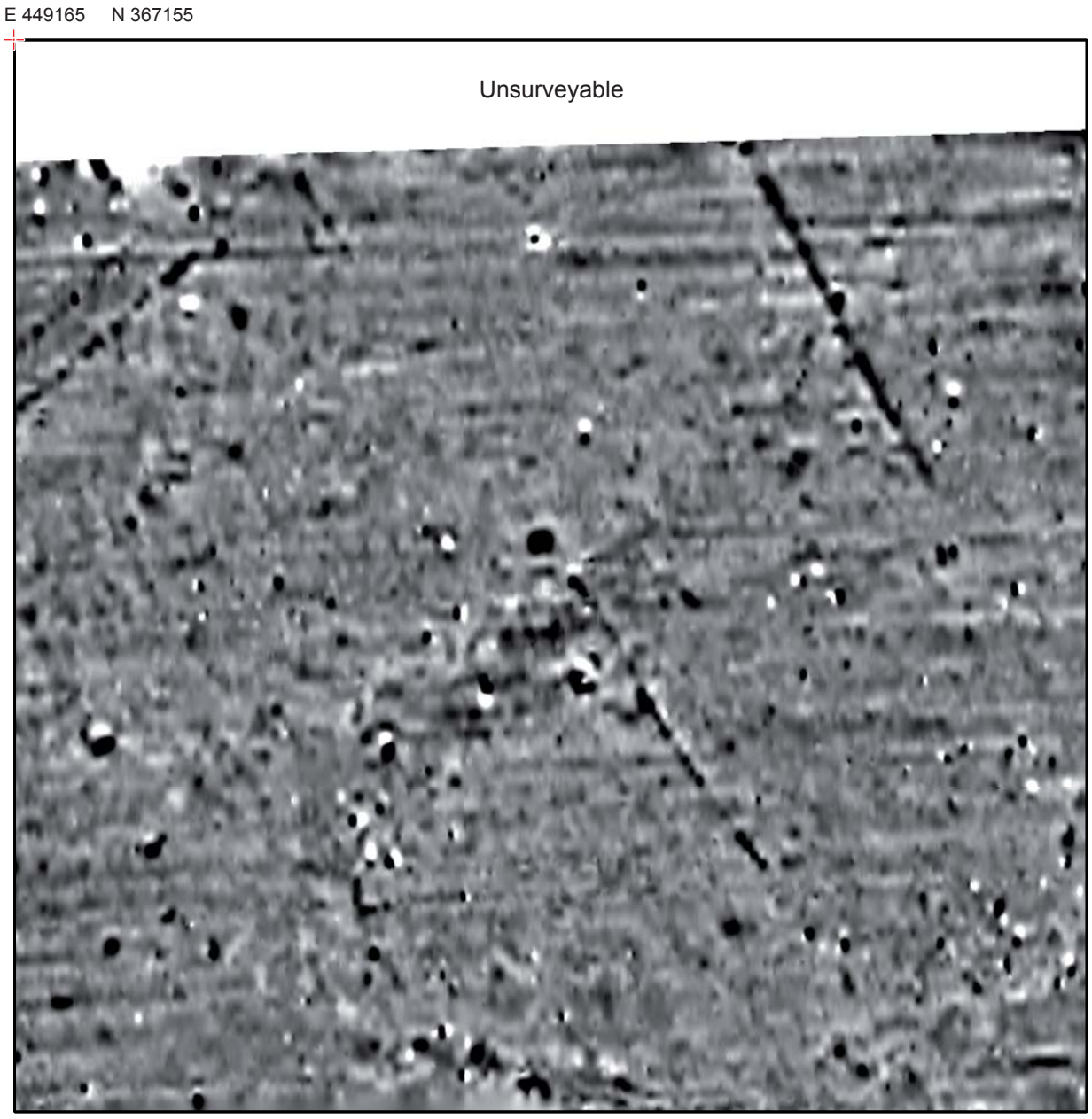




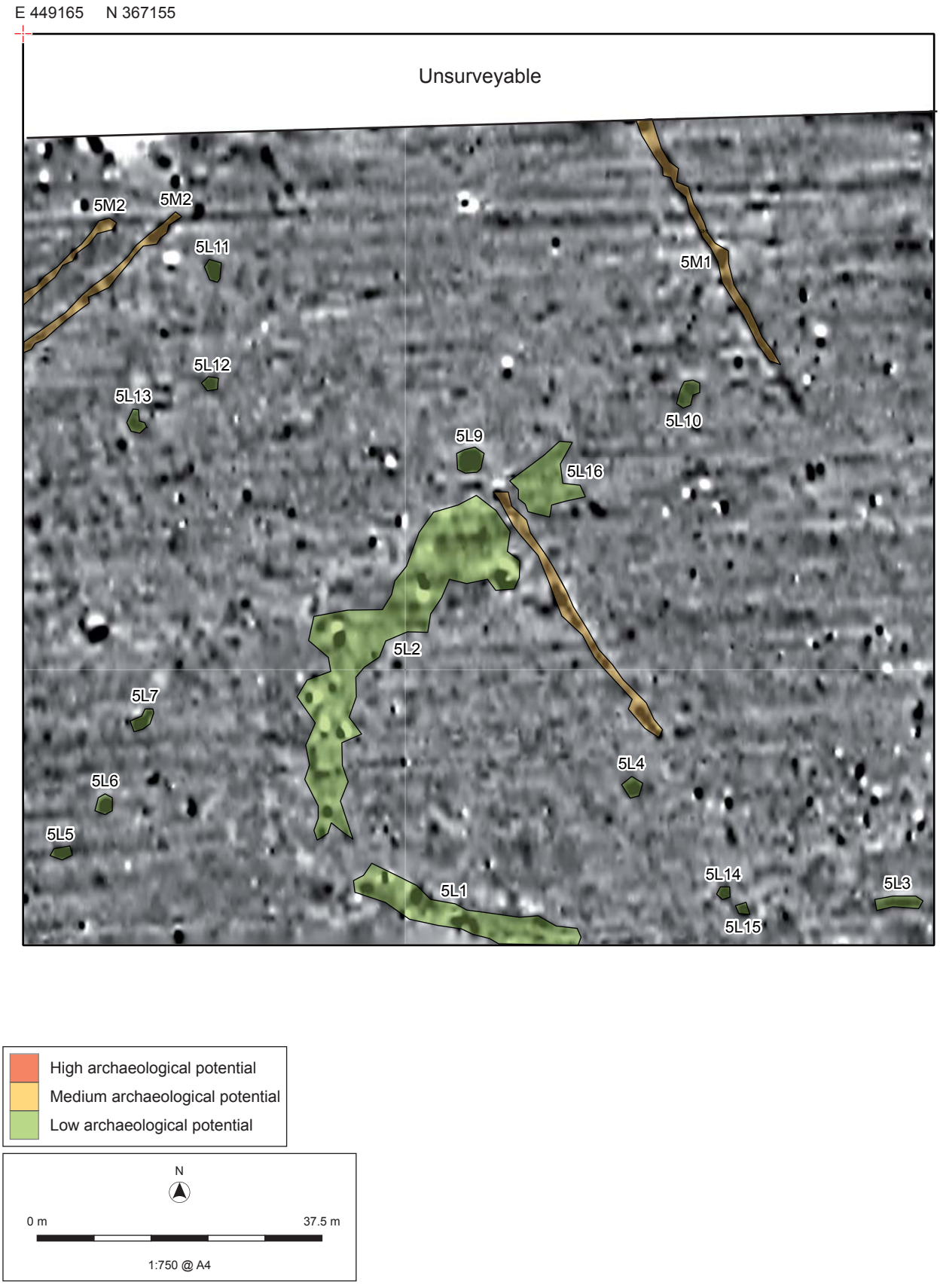
Illus 6 - Project Sunrise, Bolsover District, Derbyshire: Turbine 4



Illus 7 - Project Sunrise, Bolsover District, Derbyshire: Turbine 4, with interpretation



Illus 8 - Project Sunrise, Bolsover District, Derbyshire: Turbine 5



Illus 9 - Project Sunrise, Bolsover District, Derbyshire: Turbine 5, with interpretation

Appendix 12.3: Headland Archaeology Evaluation Report

BWFD11

PROJECT SUNRISE

Archaeological Evaluation

for ECUS Limited

October 2011

HEADLAND ARCHAEOLOGY (UK) Ltd

REGISTERED IFA ORGANISATION

PROJECT SUNRISE

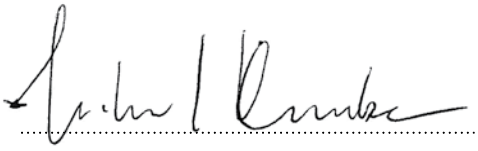
Archaeological Evaluation

for ECUS Limited

October 2011

HA Job no.: BWFD11
HAS no.: 906
NGR: SK 49992 67167
Parish: Scarcliffe
Council: Derbyshire
OASIS ref.: headland3-110980
Archive will be deposited with: Derbyshire Record Office

Project Manager	Mike Kimber
Author	Jozef Doran
Fieldwork	Dale Rouse & Jozef Doran
Graphics	Anna Sztromwasser & Caroline Norrman
Approved by	Mike Kimber, Project Manager



Headland Archaeology (UK) Ltd

Technology Centre, Stanbridge Road, Leighton Buzzard, Bedfordshire LU7 4QH
T 01525 850 878 **E** leighton.buzzard@headlandarchaeology.com
www.headlandarchaeology.com

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Site location
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Trench locations
Illus 3 5
Trench 3 facing west, showing geology at east of site
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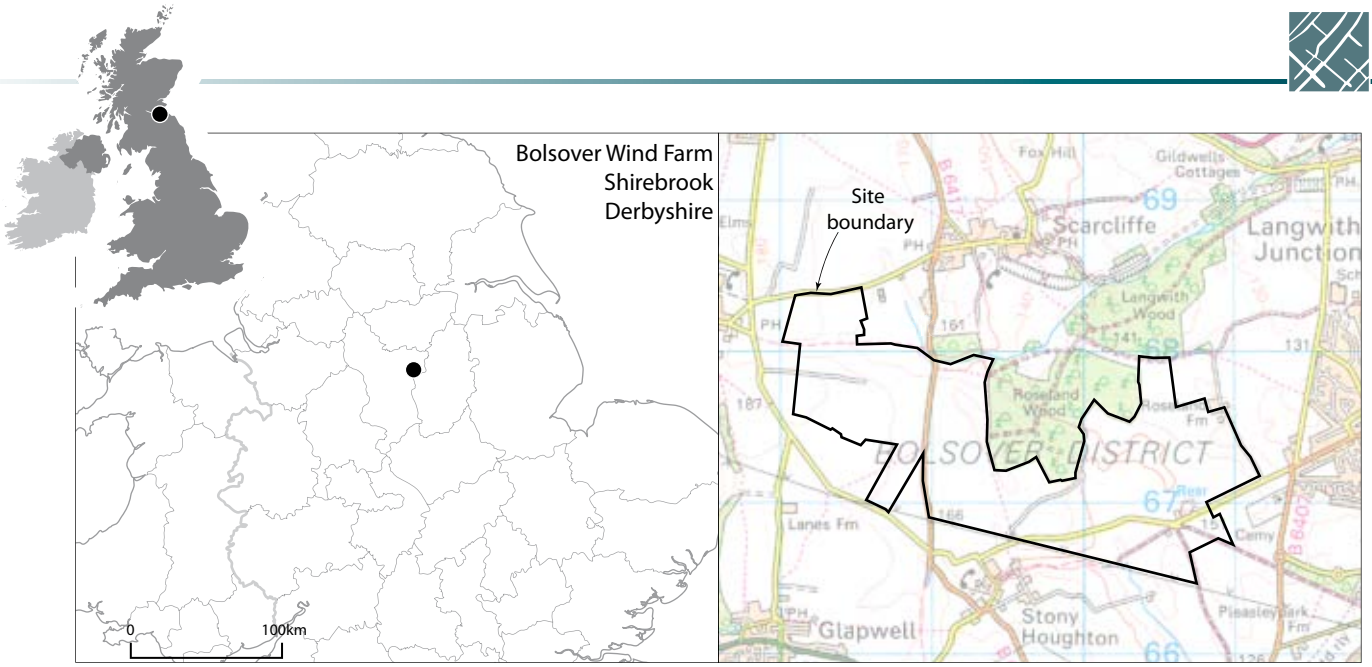
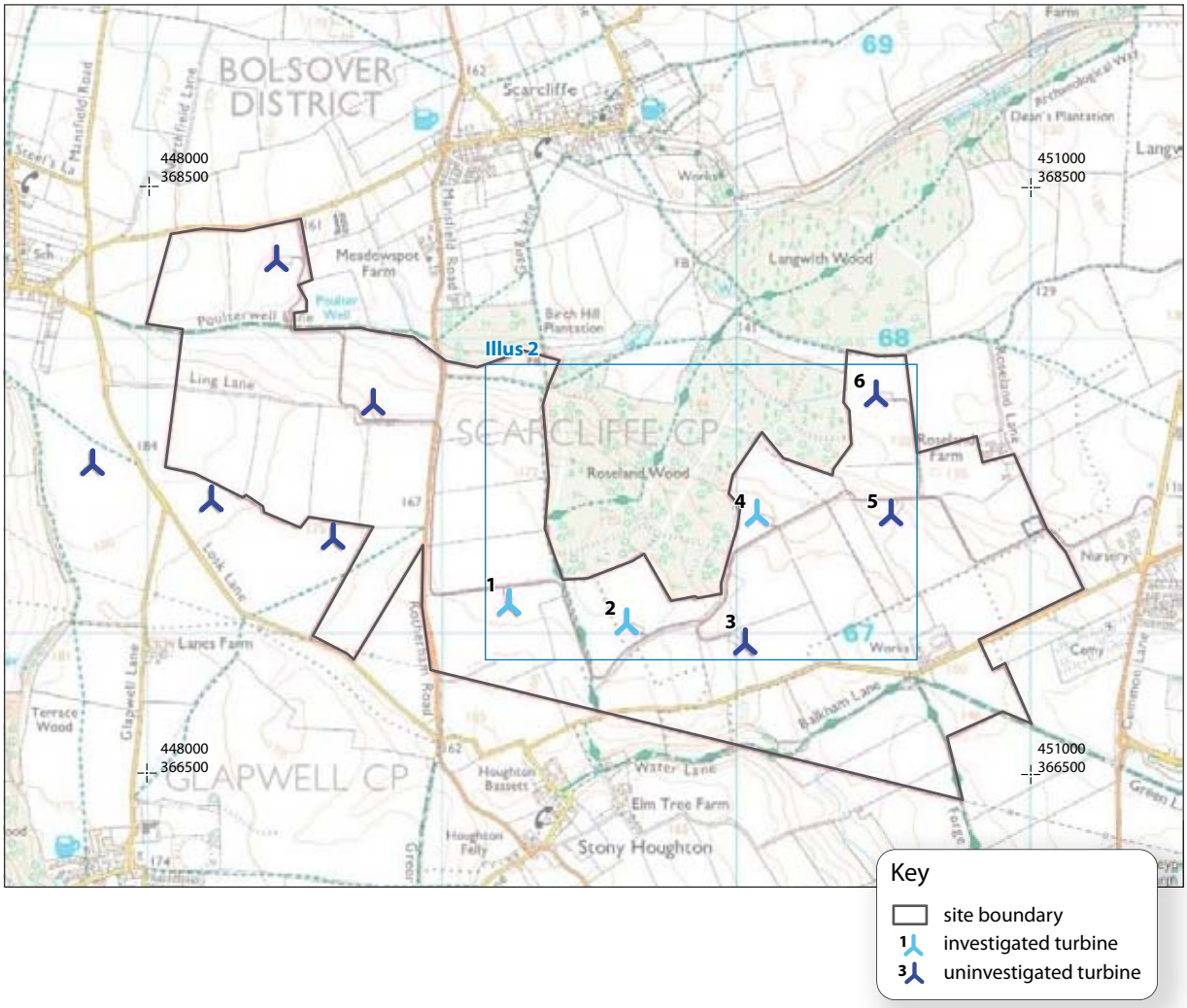
Trench 6 facing west, showing geology at west of site





Scale 1:25,000 @ A4

N

0 1km

Illus 1
Site location

PROJECT SUNRISE

Archaeological Evaluation

Headland Archaeology undertook a programme of archaeological evaluation at Roseland Wood, Shirebrook, Derbyshire as part of the Environmental Assessment phase of a proposed six turbine wind farm development. The evaluation consisted of six trial trenches located in the footprints of three turbines over anomalies found during a geophysical survey of the site prior to this investigation. No archaeological remains were discovered.

1. INTRODUCTION

Headland Archaeology undertook a programme of archaeological evaluation at Roseland Wood, Shirebrook, Derbyshire, *c.* 5km north east of the centre of Mansfield. The evaluation was conducted as part of the planning application process, with the results to form part of an Environmental Impact Assessment. The Environmental Assessment is being prepared by ECUS Ltd on behalf of Rider Levett Bucknall UK Ltd.

The site is situated along the southern slope of a low hill that runs east to west just south of Roseland Wood and to the west of the village of Shirebrook, and the local topography is generally flat with some gentle slopes. The natural geology consists of dolomitised limestone overlain by clay deposits and the land within the site boundary is currently agricultural.

There is evidence for human activity from the prehistoric to the Romano British periods within the site boundary, though this is limited to isolated find spots and a possible enclosure suggested by crop marks to the north east of the site. Within 5km of the site are several notable historic sites, including Hardwick Hall and Bolsover Castle.

The evaluation was undertaken in accordance with a Written Scheme of Investigation agreed by the client's consultants with the planning authority (Burn 2011).

1.1 Previous work

A programme of geophysical survey was carried out at the site prior to the archaeological evaluation stage (Harrison 2011). Linear anomalies that were interpreted as potentially representing derelict field boundaries were identified at Turbines 1, 2, 4 and 5; at Turbine 4, two other potentially significant anomalies were located: an irregular anomaly located on top of a small hillock, and a curvilinear anomaly towards the north-east of the turbine base area that was interpreted as a possible prehistoric enclosure.

2. OBJECTIVES

The primary objectives of the project were:

- To identify any archaeological features in the specific areas identified by geophysical survey
- Where possible to establish the date, nature and level of preservation of any archaeological remains within these areas.
- To produce and deposit a satisfactory archive and disseminate the results of the work via grey-literature reporting and publication as appropriate.

3. METHODOLOGY

Six archaeological trial trenches were excavated in pre-agreed locations, specifically targeted over geophysical anomalies that may have represented archaeological features. One trench was excavated at Turbine 1 measuring 15m x 2m, targeted over two intersecting linear anomalies. Two trenches were excavated at Turbine 2, each measuring 7.5m x 2m and each targeted over linear anomalies. Three trenches, each measuring 15m x 2m, were excavated at Turbine 3 as this area appeared to have the greatest archaeological potential. One trench was targeted over two parallel north-south linear anomalies, one was targeted over an irregular anomaly on the summit of a small hillock, and one was targeted over a curvilinear anomaly to the east of the site.

Trenches were excavated using a mechanical excavator equipped with a toothless ditching bucket, under constant archaeological supervision. Topsoil was removed and excavation ceased at either undisturbed geological deposits (sondages were dug in some trenches to establish whether deposits had any sign of disturbance) or when potential archaeological features/deposits were identified. These were then further investigated by hand excavation. Trenches were left to weather for a minimum of one day, so as to increase the chances of feature identification. Each trench was cleaned by hand where necessary to assist the identification and interpretation of any potential exposed archaeological features.

The recording was in accordance with I*f*A standards and the Headland Archaeology site recording manual. All contexts were given unique numbers. A general photographic record was maintained during the course of the fieldwork and colour slide, black and white and digital photographs were taken. An overall site plan was recorded and related to the National Grid. Trench record sheets were completed and recorded digitally, or by hand at 1:100 where features were present. Sample sections were hand drawn at a scale of 1:10. All recording was undertaken on pro forma record cards.

4. RESULTS

4.1 General soil layers on the site

The undisturbed geological horizon (1001, 2001, 3001, 4001 and 6001) over the whole site comprised light yellowish red silty clay, with occasional sub-rounded dolomitised limestone fragments averaging between 5–40mm, and occasional manganese flecks. The deposit was identified beneath topsoil at a depth of between 0.23–0.29m across the whole site except for Trench 2, and was 0.06–0.24m thick. Beneath the clay deposit lay dolomitised limestone bedrock, except in Trench 2 where the bedrock directly underlay the topsoil.

4.2 Turbine 1

A single trench, Trench 6, was excavated at Turbine 1, targeted near the intersection of two crossing linear anomalies. No features were identified in this trench. It is possible that the geophysical anomalies identified are the result of slight changes in the composition of the clay horizon, as this deposit is slightly variable across the site.

4.3 Turbine 2

Two trenches, Trench 4 and Trench 5, were excavated at Turbine 2, each targeted over a separate linear anomaly. In Trench 4 beneath the topsoil, a very irregular feature, [3003], was identified, coinciding with the position of an east-west linear anomaly revealed by geophysical survey. A slot was excavated through this feature, and it was subsequently found to be a dip in the bedrock filled with clay.

No features were identified in Trench 5 other than ploughmarks relating to modern cultivation; these were also visible in Trench 4.

4.4 Turbine 4

Three trenches were excavated at Turbine 4, Trench 1, Trench 2 and Trench 3.

Trench 1 was targeted over a curvilinear anomaly situated towards the north-east part of the turbine base area. Beneath the topsoil a possible feature, [6003], was identified and investigated, proving to be a composition change in the natural. No features were identified coinciding with the curvilinear anomaly identified in the geophysical survey.

Trench 2 was targeted over an irregular magnetic anomaly situated at the summit of a small hillock near the centre of the turbine base area. The anomaly was identified as being the result of a rise in the bedrock in this part of the site and not of any archaeological significance.

Trench 3 was targeted over two parallel north-south linear anomalies running from the south-east corner of the turbine base. Beneath the topsoil, two possible north-south linear features roughly in position of the geophysical anomalies (4003 and 4004) were identified. [4003] was hand cleaned and slot – excavated, and was found to have a very irregular profile and a diffuse interface with deposit [4001]. [4004] was similarly investigated, and was found to be even more diffuse than [4003], with undefined edges and voids indicating possible animal burrowing. Both features were interpreted as natural due to their extremely irregular character and are possibly the result of depth variations in the geological deposits, as this part of the site was located at the bottom of a slope in the local topography.

N

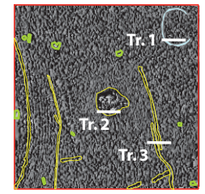
Key

- high archaeological potential
- moderate archaeological potential
- low archaeological potential
- proposed turbine area

449200
367680

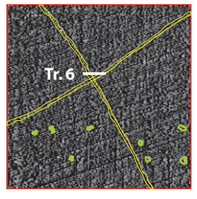
450500
367680

Turbine 6 (uninvestigated)



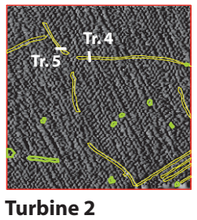
Turbine 4

Turbine 5 (uninvestigated)



Turbine 1

449200
366980



Turbine 2

Turbine 3 (uninvestigated)

450500
366980

0 100m
1:4,000@A3

Illus 2
Trench locations

Illus 3
Trench 3 facing west, showing geology at east of site

Illus 4
Trench 6 facing west, showing geology at west of site

Modern ploughmarks were observed in all trenches located at Turbine 4.

5. DISCUSSION

The trenching undertaken at the site did not reveal any archaeological features other than ploughmarks relating to modern cultivation, identified as such as they were aligned with both recent ploughing observed at surface level and current field boundaries. The potential features revealed through the geophysical survey appear to be the result of localised variations in the depth of the bedrock.

The fieldwork has succeeded in establishing that the geophysical anomalies are not of archaeological origin within the areas investigated.

6. ARCHIVE

The archive is currently located at Headland Archaeology's premises (Unit 1, Premier Business Park, Faraday Road, Westfield Trading Estate, Hereford, HR4 9NZ) and will be deposited with Derbyshire Record Office within six months of report acceptance.

7. REFERENCES

Burn, A, 2011, *Project Sunrise, Shirebrook, Derbyshire; Archaeological Evaluation,* Unpublished client report, ECUS Ltd, 2011.

Harrison, S, 2011, *A Magnetic Gradiometer Survey of Turbine Locations at a Windfarm Development, Roseland Wood, Shirebrook, Derbyshire,* Unpublished client report, Headland Archaeology (UK) Ltd.

APPENDIX 1 – SITE REGISTERS

Context register

Context no.	*Area*	*Description*
1000	Trench 6, Turbine 1	Topsoil – reddish brown friasble loamy silt
1001	Trench 6, Turbine 1	Natural subsoil – yellowish red clay
1002	Trench 6, Turbine 1	Natural bedrock – creamy yellow dolomitised limestone
2000	Trench 5, Turbine 2	Topsoil – reddish brown friasble loamy sand
2001	Trench 5, Turbine 2	Natural subsoil – yellowish red clay
2002	Trench 5, Turbine 2	Natural bedrock – creamy yellow dolomitised limestone
3000	Trench 4, Turbine 2	Topsoil – reddish brown friasble loamy sand
3001	Trench 4, Turbine 2	Natural subsoil – yellowish red clay
3002	Trench 4, Turbine 2	Natural bedrock – creamy yellow dolomitised limestone
3003	Trench 4, Turbine 2	Patch of natural depression in bedrock
4000	Trench 3, Turbine 4	Topsoil – reddish brown friasble loamy silt
4001	Trench 3, Turbine 4	Natural subsoil – yellowish red clay
4002	Trench 3, Turbine 4	Natural bedrock – creamy yellow dolomitised limestone
4003	Trench 3, Turbine 4	Irregular linear feature – probable geological anomaly
4004	Trench 3, Turbine 4	Irregular linear feature – probable geological anomaly
5000	Trench 2, Turbine 4	Topsoil – reddish brown friasble loamy silt
5001	Trench 2, Turbine 4	Natural bedrock – creamy yellow dolomitised limestone
6000	Trench 1, Turbine 4	Topsoil – reddish brown friasble loamy silt
6001	Trench 1, Turbine 4	Natural subsoil – yellowish red clay
6002	Trench 1, Turbine 4	Natural bedrock – creamy yellow dolomitised limestone
6003	Trench 1, Turbine 4	Very slight colour change in [6001] – geological anomaly

Photographic register

Photo no.	*Colour slide*	*B&W*	*Digital*	*Direction facing*	*Description*
001	Y	Y	Y	–	ID shot
002	Y	Y	Y	W	Trench 6, excavated
003	Y	Y	Y	S	S-facing sample section of Trench 6
004	Y	Y	Y	E	Trench 5, excavated
005	Y	Y	Y	S	N-facing sample section of Trench 5
006	Y	Y	Y	N	Trench 4, excavated
007	Y	Y	Y	E	W-facing sample section of Trench 4
008	Y	Y	Y	W	Trench 3, excavated
009	Y	Y	Y	N	S-facing sample section of Trench 3
010	Y	Y	Y	W	Trench 2, excavated

Photo no.	*Colour slide*	*B&W*	*Digital*	*Direction facing*	*Description*
011	Y	Y	Y	N	S-facing sample section of Trench 2
012	Y	Y	Y	W	Trench 1, excavated
013	Y	Y	Y	N	S-facing sample section of Trench 1

Trench register

Trench no.	*Area*	*Description*	*Length (m)*	*Depth (m)*
1	Turbine 4	Excavated at the north-eastern part of the base for Turbine 4 on ground sloping slightly to the east. Orientated east-west. Targeted over a curvilinear anomaly identified through geophysical survey. No archaeological features. Modern ploughmarks visible.	14m	0.25m (trench), 0.49m (sondage)
2	Turbine 4	Excavated at the centre of the base for Turbine 4 at the summit of a small hillock. Orientated east-west. Targeted over an irregular geophysical anomaly. No archaeological features. Bedrock lies directly beneath topsoil in this trench. Modern ploughmarks visible.	14m	0.32m
3	Turbine 4	Excavated towards the south-eastern part of the base for Turbine 4. Orientated east-west. Targeted over two parallel linear geophysical anomalies. No archaeological features. Modern ploughmarks visible.	14m	0.28m (trench), 0.39m (sondage)
4	Turbine 2	Excavated towards the north part of the base for Turbine 2 on flat ground, targeted over an east-west linear geophysical anomaly. Orientated north-south. One possible feature, [3003], was revealed upon investigation to be a dip in the bedrock. No archaeological features. Modern ploughmarks visible.	7.5m	0.29m (trench), 0.42m (sondage)
5	Turbine 2	Excavated towards the north eastern part of the base for Turbine 2 on flat ground, targeted over a north-south linear geophysical anomaly. Orientated east-west. No archaeological features. Modern ploughmarks visible.	7.5m	0.28m (trench), 0.12m (sondage)
6	Turbine 1	Excavated on flat ground near the centre of the base for Turbine 1, targeted to catch two intersecting linear anomalies identified through geophysical survey. Orientated east-west. No archaeological features. No ploughmarks noted.	15m	0.25m (trench), 0.45m (sondage)

Drawing register

Drawing no.	*Plan*	*Section*	*Description*
1	Y	–	1:100 plan of Trench 6
2	–	Y	1:10 sample section of Trench 6, N - facing
3	Y	–	1:100 plan of Trench 5
4	–	Y	1:10 sample section of Trench 5, N - facing
5	Y	–	1:100 plan of Trench 4
6	–	Y	1:10 sample section of Trench 4, W - facing
7	Y	–	1:100 plan of Trench 3
8	–	Y	1:10 sample section of Trench 3, S - facing
9	Y	–	1:100 plan of Trench 2
10	–	Y	1:10 sample section of Trench 2, S - facing
11	Y	–	1:100 plan of Trench 1
12	–	Y	1:10 sample section of Trench 1, S-facing

OASIS DATA COLLECTION FORM: England

OASIS ID: headland3-111081

Project details

Project name	Project Sunrise, Shirebrook, Derbyshire; Archaeological Evaluation; 12-15/09/2011
Short description of the project	Headland Archaeology undertook a programme of archaeological evaluation at Roseland Wood, Shirebrook, Derbyshire as part of an Environmental Assessment fior a proposed 6 turbine wind farm development. The evaluation consisted of 6 trial trenches located in the footprints of 3 turbines over anomalies found during a geophysical survey of the site prior to this investigation. No archaeological features were found.
Project dates	Start: 12-09-2011 End: 15-09-2011
Previous/future work	Yes / Not known
Any associated project reference codes	BWFD11 - Sitecode
Type of project	Field evaluation
Site status	None
Current Land use	Cultivated Land 2 - Operations to a depth less than 0.25m
Monument type	NONE None
Significant Finds	NONE None
Methods & techniques	'Targeted Trenches'
Development type	Wind farm developments
Prompt	Environmental Assessment regulations Schedule 1 projects (Obligatory)
Position in the planning process	Pre-application

Project location

Country	England
Site location	DERBYSHIRE BOLSOVER SCARCLIFFE Project Sunrise
Postcode	NG19 8TR
Study area	3.00 Hectares
Site coordinates	SK 495 670 53.1974874946 -1.258946386170 53 11 50 N 001 15 32 W Point
Height OD / Depth	Min: 153.00m Max: 167.00m

Project creators

Name of Organisation	Headland Archaeology (UK) Ltd.
Project brief originator	Consultant
Project design originator	Headland Archaeology (UK) Ltd.
Project director/manager	Mike Kimber AIfA
Project supervisor	Dale Rouse
Type of sponsor/funding body	Developer

Project archives

Physical Archive Exists?	No
Digital Archive Exists?	No
Paper Archive recipient	Derbyshire Records Office
Paper Contents	'none'
Paper Media available	'Context sheet','Correspondence','Diary','Drawing','Map','Photograph','Report'

Project bibliography 1

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Headland Archaeology (UK) Ltd

North East (HQ)
13 Jane Street, Edinburgh EH6 5HE
T 0131 467 7705 • **F** 0131 467 7706 • **E** office@headlandarchaeology.com

North West
10 Payne Street, Glasgow G4 0LF
T 0141 354 8100 • **F** 0141 332 9388 • **E** glasgowoffice@headlandarchaeology.com

Midlands & West
Unit 1, Premier Business Park, Faraday Road, Hereford HR4 9NZ
T 0143 236 4901 • **F** 0143 236 4900 • **E** hereford@headlandarchaeology.com

South & East
Technology Centre, Stanbridge Road, Leighton Buzzard, Bedfordshire LU7 4QH
T 01525 850 878 • **E** leighton.buzzard@headlandarchaeology.com

www.headlandarchaeology.com